

Earwigs attracted to Light

By A. BRINDLE

Most species of earwigs appear to be nocturnal, hiding by day in suitable crevices, and emerging at night to feed. These nocturnal habits are probably the reason, at least partially, for the past misconception of their ability to fly. Although the presence of wings in the common European earwig, *Forficula auricularia* Linnaeus, has been known at least since the eighteenth century, its ability to fly has been doubted as recently as the years preceding the last war. These doubts were not entirely ill-founded, and were partly based on the lack of recorded observation on flight, or their rarity, and also partly due to observations such as those of Mallock (1919), who stated that "In the case of earwigs, at any rate of the species found in England, it seems more than doubtful whether the wings are ever used. The thorax only contains traces of flight muscles and I have not been able to distinguish any folding muscles in the wings themselves". The lesser earwig of Britain, *Labia minor* (Linnaeus) has long been known to fly, but its undoubted ability in this respect was thought to be partly due to its smaller size.

As late as 1939, Burr thought it desirable to collect observations on flight by the common earwig, and to put on record their ability to do so. In the same paper, however, Burr notes that although he has never doubted their ability to fly, he has never seen a common earwig in flight. As far as entomologists are concerned it is rare to see a common earwig flying, and such flights are probably short and infrequent. The wings can be very quickly unfolded previous to flight and as quickly refolded afterwards, and the necessity for flight probably arises infrequently; added to their nocturnal habits, this may account for the rarity of observations on their flight. Any short notes on such features, however, are of great interest, such as the recent one by Baker (1969) who records several specimens of *Anechura asiatica* Semenov in flight, several feet above the ground, in the Sardabrud Valley, Iran, on 6th November 1965. It would be interesting to know of the weather conditions at the time and the duration or length of these flights. It is likely that weather conditions do affect the flight, since *Labia minor* seems to fly most readily during hot weather.

Verhoeff (1917) took the view that the common earwig can only unfold its wings under unusual circumstances, such as a "strong muscular development" during a prolonged period of hot and humid weather, so that earwigs in north temperate countries rarely experience suitable conditions. The wings are folded lengthwise, like a fan, and then folded transversely, so that they lie beneath the elytra with only the tips protruding; the elytra are locked in place by a system of hook-like structures on the underside of each elytron and on the metanotum. Burr (1939) quotes Verhoeff (1917) as suggesting that to over-

come this locking device great muscular effort is needed, and this must be developed through "great excitement"; apparently the common earwig is phlegmatic and never succeeds in being worked up to such a pitch of excitement. The vision of an excited earwig taking to flight is fascinating, and perhaps the use of a word other than the ambiguous "excitement" may have been better, but the general idea seems to be clear.

Earwigs are mainly tropical or subtropical, and are poorly represented in Britain. The ubiquitous *Forficula auricularia* is the only common species, although the lesser earwig, *Labia minor* is widely distributed but less often recorded. Earwigs are attracted in the evening to the lepidopterist's sugar, as the older lepidopterists who remember this possibly out-of-date method of moth-hunting, will probably recall, but they are also attracted to light. The increasing use of light and light-traps in the tropics has resulted in many more records of flight in earwigs. Not all the earwigs recorded at light have flown in, however, since occasional ones are without wings, but the majority do seem to have used their wings. Earwigs can climb well, since some have been recorded in the crowns of *Pandanus*, and various palms in the tropics, so there would be little difficulty in entering some light traps without the use of wings. Some of the records may also refer to light used on a sheet.

During the past years, a large number of tropical earwigs, taken at light, have been examined by the present author, and whilst the following notes are not exhaustive, they do suggest that the attraction of light for earwigs is fairly general throughout the order. All the records noted below are of earwigs taken at light; some records do refer to light traps and a few specifically to M.V. lamps.

In the family Diplatyidae, *Diplatus macrocephalus* (Beauvois) from Africa, and both *D. fletcheri* Burr and *D. greeni* Burr from Ceylon, have been noted. Most of this genus are fully winged and flight in some species has been previously known. In the Pygidicranidae, only *Pygidicrana bivittata* (Erichson) from Surinam, and *Echinosoma yorkense* Dohrn from the Solomon Islands are noted; this heterogenous family includes both winged and wingless species but many are rather large and apparently ill-adapted for flight. The family Carcinophoridae is very large, but it is typically composed of apterous species; a minority are fully winged. *Euborellia annulives* (Lucas) and *E. femoralis* (Dohrn) have been recorded from the Western Pacific, the latter species being fully winged whilst the first species is entirely apterous. *E. janeirensis* (Dohrn) a species with short elytra and aborted wings, has also been recorded from Surinam. The small family Labiduridae is represented by *Labidura ripara* (Pallas) from Africa, Ceylon, and the Western Pacific; and *Nala lividipes* (Dufour) and *Dendroiketes corticinus* (Burr) from Ceylon. Most species of this family have wings, but *L. riparia* is variable and may have fully developed wings or the wings may be aborted.

The large family Labiidae is the best represented. *Labia minor* (Linnaeus) from Africa; *L. curvicauda* (Motschulsky) from the Solomon Islands and Ceylon; *L. pilicornis* (Motschulsky) from Ceylon, the Solomon Islands, and the Western Pacific; *Spongovostox assiniensis* (Bormans) and *S. tripunctatus* Borelli from Africa, and *S. feae* (Bormans) from the Western Pacific, *Marava arachidis* (Yersin) is frequent at light in the Western Pacific, and is also recorded from the Solomon Islands, whilst *Marava alter* (Burr) is recorded from Surinam. This family is as large as the Carcinophoridae, but is generally composed of smaller species, typically fully winged. The Chelisochidae is represented by *Proreus laetior* (Dohrn) from the Solomon Islands and Western Pacific; *P. delicatulus* Burr from Ceylon, and *Hamaxas nigrorufus* (Burr) from the Solomon Islands. Although *Chelisoches morio* (Fabricius) is common from New Guinea to the Solomon Islands and the Pacific, it is rarely recorded at light, but this is due to it being diurnal, and active through the day; it flies readily during the day. Although the family Forficulidae is large, only a few records have been noted, including *Hypurgus humeralis* (Kirby) from Ceylon; *H. ova* (Bormans) from Angola; and *Diapterasticus erythrocephalus* (Olivier) from Africa. Although this family is mainly fully winged, the size of the species is generally larger than in the Labiidae, and it is possible that size does play a part in the frequency of flight. However the most notable instance known to the present author of earwigs in flight and being attracted to light, concerns the Forficulidae.

Mr J. A. Whellan (in litt.) records that he runs a light trap at Limbe, Malawi, mainly for Lepidoptera. Up to the night of 7/8th August 1968, only one specimen of an earwig, *Forficula senegalensis* Serville, had been found in the trap. On the night of 7/8th August, however, which was full moon, there were 140 specimens of this insect taken in the trap. On the following night there were more, and they began to arrive as soon as the trap was switched on, at dusk, about 6 p.m., but it is not known if they continued to arrive throughout the night. On the next nights the numbers of these insects dwindled to 20, 10, and 2. This species is common and distributed throughout Africa, south of the Sahara.

These specimens have been examined, and the range of the size of the male forceps is large. In many earwigs, such as the common earwig of Britain, the forceps of the males vary in size, from small (microlabic) to large (macrolabic). Each branch of the smaller forceps of *F. senegalensis* has a inner wider flattened part at the base, as in *F. auricularia*, but more rectangular, whereas the base of the branches of the forceps of the large form is not greatly widened, but the branches are much longer. At first these specimens with the long slender branches of the forceps were thought to be *F. brolemanni* Borelli, but more specimens of *F. senegalensis* from Angola

have since been examined, and these show a gradation from the small to the large form, and correspond with those from Malawi.

The greater use of light traps in the tropics, as in Britain, is leading to a better knowledge of the insects other than Lepidoptera for which the traps are mainly used. Such records of earwigs at light are useful in understanding the weather conditions under which earwigs are attracted to light, which is possibly the same as for most insects, and also for the frequency of flight. Further records of flight other than to light traps are, of course, equally desirable.

I am most grateful to Mr J. A. Whellan, for the opportunity to examine the specimens of *Forficula senegalensis* Serville, and for the details of his remarkable observation of an apparent massed flight of these insects.

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Notes and Observations

LARVAL ECDYSIS OF BUCCULATRIX SPP. (LEP. LYONETIDAE): The construction of "moulting cocoons" by the larvae of *Bucculatrix* species is well known, though not mentioned in our standard text-books; however, I at any rate did not know until today that the manner of ecdysis is also unusual in this genus. Inside their moulting cocoons the larvae curl themselves into a tight circle. When the moult takes place, instead of the old skin peeling backwards, bunching up as it goes, the larva walks straight out of its skin, leaving it fully extended and inflated, exactly in the attitude the larva had assumed. Consequently the cocoon looks as if it still housed a live larva, and it is only if the leaf to which it is affixed is held up to a strong light that the skin will be perceived to be empty. On the other hand, the moult for pupation is normal, and the cast larval skin contracts into the usual little bundle, with daylight showing between it and the anus of the pupa.

This observation is based on the examination of the moulting cocoons of seventeen larvae of *B. nigricomella* Zell. It is highly probable that my remarks hold good for all the species in the genus; certainly in the past I have found moulting cocoons of some of the other species which contained larvae which subsequently appeared to be "dead".—A. M. EMMET, Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 6.iv.71.